UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

JUN 2 1989

NOTE TO: Robert M. Bernero, Director
NMSS

FROM: John T. Greeves, Deputy Director
LLWMD

SUBJECT: CONTAMINATED TURBINE LUBE OIL DISPOSAL AT GRAND GULF NUCLEAR STATION

In response to your request for information, I have attached a summary of those activities at Grand Gulf Nuclear Station involving disposal and burning of contaminated turbine lubricating oil.

If you have any additional questions or would like a briefing on this topic, I can be reached on X23344.

Attachment: As stated

cc: DMartin, LLWMD
KDragonette, LLWMD
RBangart, LLWMD
LPittiglio, LLWMD
TJohnson, LLWMD
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9003230290

SUMMARY OF CONFERENCE CALL
BETWEEN
NRC AND MISSISSIPPI POWER AND LIGHT

DATE: May 24, 1989

TIME: 11:00 a.m.

SUBJECT: GRAND GULF NUCLEAR POWER PLANT TURBINE LUBRICATING OIL
(Docket No. 50-416)

PARTICIPANTS:

Mississippi Power & Light (601) 984-9210	NRC
Tom Reaves, Director Nuclear Support	Larry Pittiglio, LLWMD
Guy Ceasar, Director Nuclear Licensing	Tim Johnson, LLWMD
	Kitty Dragonette, LLWMD
	Les Kintner, NRR
	Dan Martin, LLWMD

Additional background information was provided prior to the conference call by:

Floyd Cantrell, Region II Inspector, 242-5534
Harold Christenson, Senior Resident Inspector, 601-437-4620

PURPOSE: During a recent conversation with a senior management official of Mississippi Power & Light, owners of the Grand Gulf Nuclear Power Plant, Robert Bernero, Director, NMSS, learned that the utility had disposed of some contaminated turbine lubricating oil by burning at one of the utility's fossil fuel electric generating plants. R. Bernero requested a review of this matter to determine what actually occurred.

SUMMARY: The licensee, in the May 24, 1989 conference call, provided the following information concerning the turbine oil. Approximately 18,000 gallons of uncontaminated lubricating oil were discharged from the turbine during turbine trips from May 1985 through January 1988. The turbine released about 750 gallons per trip which overflowed into the floor sump. The sump contained contaminated water. The hydraulic control system problem which caused the oil release was corrected in January 1988. Once the problem was corrected, the licensee cleaned up and disposed of the oil. The oil was separated from the contaminated water by centrifuge and processed through 0.5 micron filters to remove

particulate matter. These treatment methods resulted in four components: (1) 14,050 gallons of oil considered to be decontaminated and nonradioactive; (2) 1,150 gallons of contaminated oil; (3) 2,326 gallons of oily sludge; and (4) 350 gallons contained in contaminated rags, trash, etc. The 1,150 gallons of contaminated oil and the contaminated rags and trash were sent to Scientific Ecology Group, Oak Ridge, Tennessee for further processing and disposal as radioactive material. The 2,326 gallons of sludge was solidified by B&W on site and sent to the Beatty, Nevada commercial low-level radioactive waste site for disposal.

The 14,050 gallons of treated oil was considered to be nonradioactive because: (1) the contamination was believed to be fixed in the water and particulate matter that was present in the turbine building floor drain sump before the spills, and essentially all the water and particulate matter had been removed from the oil; and (2) the oil had been surveyed and determined not to have detectable radioactivity at a lower limit of detection (LLD) of 5×10^{-7} microcuries/ml, gamma. (Staff has calculated that at this LLD, the 14,050 gallons of oil would contain no more than about 26.6 microcuries of gamma emitting radionuclides.) The decontaminated oil was then shipped to a fossil fuel plant (sister plant) and burned. The oil was used as a fuel from June 1988 through January 1989 in two or three separate burns. The utility stated that their Technical Specification 3/4.11 Radioactive Effluents provided a basis for establishing the LLD and for releasing the decontaminated oil. (See enclosed copy.)

FOLLOW-UP: The NRC staff indicated to the utility representatives that they might have additional questions after the information provided was more carefully evaluated. NMSS staff recommends that NRR determine whether or not the language in the Technical Specification 3/4.11 provided a correct basis for the licensee's action. NMSS staff are also concerned that the utility's actions in this case set an inappropriate precedent for other utilities and have identified the issue to NRR and the Region for appropriate action. NMSS staff will coordinate with NRR and inspection staff on what additional actions are taken.

3/4.11 RADIOACTIVE EFFLUENTS

3/4.11.1 LIQUID EFFLUENTS

CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.11.1.1 The concentration of radioactive material released in liquid effluents to UNRESTRICTED AREAS (see Figure 5.1.3-1) shall be limited to the concentrations specified in 10 CFR Part 20, Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2×10^{-4} microcuries/ml total activity.

APPLICABILITY: At all times.

ACTION:

With the concentration of radioactive material released in liquid effluents to UNRESTRICTED AREAS exceeding the above limits, immediately restore the concentration to within the above limits.

SURVEILLANCE REQUIREMENTS

4.11.1.1.1 The radioactivity content of each batch of radioactive liquid waste shall be determined prior to release by sampling and analysis in accordance with Table 4.11.1.1.1-1. The results of pre-release analyses shall be used with the calculational methods in the ODCM to assure that the concentration at the point of release is maintained within the limits of Specification 3.11.1.1.

4.11.1.1.2 Post-release analyses of samples composited from batch releases shall be performed in accordance with Table 4.11.1.1.1-1. The results of the radioactivity analysis shall be used in accordance with the methodology and parameters in the ODCM to assure that the concentrations at the point of release are maintained within the limits of Specification 3.11.1.1.

TABLE 4.11.1.1.1-1

RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM

Liquid Release Type	Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Limit of Detection (LLD) (μCi/ml)[a]
A. Batch Waste Release Tanks[c]	P Each batch	P Each Batch	Principal Gamma Emitters[d]	$5x10^{-7}$
			I-131	$1x10^{-6}$
	P One Batch/M	M	Dissolved and Entrained Gases (Gamma emitters)	$1x10^{-5}$
	P Each Batch	M Composite[b]	H-3	$1x10^{-5}$
			Gross Alpha	$1x10^{-7}$
	P Each Batch	Q Composite[b]	Sr-89, Sr-90	$5x10^{-8}$
			Fe-55	$1x10^{-6}$
B. SSW Basin (prior to blowdown)	Each Blowdown	Each Batch	Principal Gamma Emitters[d]	$5x10^{-7}$
			I-131	$1x10^{-6}$

TABLE 4.11.1.1.1-1 (Continued)

RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM

TABLE NOTATION

a. The LLD is the smallest concentration of radioactive material in a sample that will yield a net count (above system background) that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system (which may include radiochemical separation):

$$LLD = \frac{4.66\ s_b}{E \cdot V \cdot 2.22 \times 10^6 \cdot Y \cdot \exp(-\lambda \Delta t)}$$

where

LLD is the "a priori" lower limit of detection as defined above (as μCi per unit mass or volume). (Current literature defines the LLD as the detection capability for the instrumentation only, and the MDC, minimum detectable concentration, as the detection capability for a given instrument, procedure, and type of sample.)

s_b is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute)

E is the counting efficiency (as counts per disintegration)

V is the sample size (in units of mass or volume)

2.22×10^6 is the number of disintegrations per minute per microcurie

Y is the fractional radiochemical yield (when applicable)

λ is the radioactive decay constant for the particular radionuclide

Δt is the elasped time between sample collection (or end of the sample collection period) and time of counting

The value of s_b used in the calculation of the LLD for a particular measurement system should be based on the actual observed variance of the background counting rate or of the counting rate of the blank samples (as appropriate) rather than on an unverified theoretically predicated variance.

Typical values of E, V, Y and Δt should be used in the calculation.

It should be recognized that the LLD is defined as an a priori (before the fact) limit representing the capability of a measurement system and not as a posteriori (after the fact) limit for a particular measurement.

TABLE 4.11.1.1.1-1 (Continued)

RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM

TABLE NOTATION (Continued)

b. A composite sample is one in which the quantity of liquid sampled is proportional to the quantity of liquid waste discharged and in which the method of sampling employed results in a specimen which is representative of the liquids released.

c. A batch release is the discharge of liquid wastes of a discrete volume. Prior to sampling for analyses, each batch shall be isolated, and then thoroughly mixed to assure representative sampling.

d. The principal gamma emitters for which the LLD specification applies exclusively are the following radionuclides: Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141, and Ce-144. This list does not mean that only these nuclides are to be detected and reported. Other peaks which are measurable and identifiable, together with the above nuclides, shall also be identified and reported.

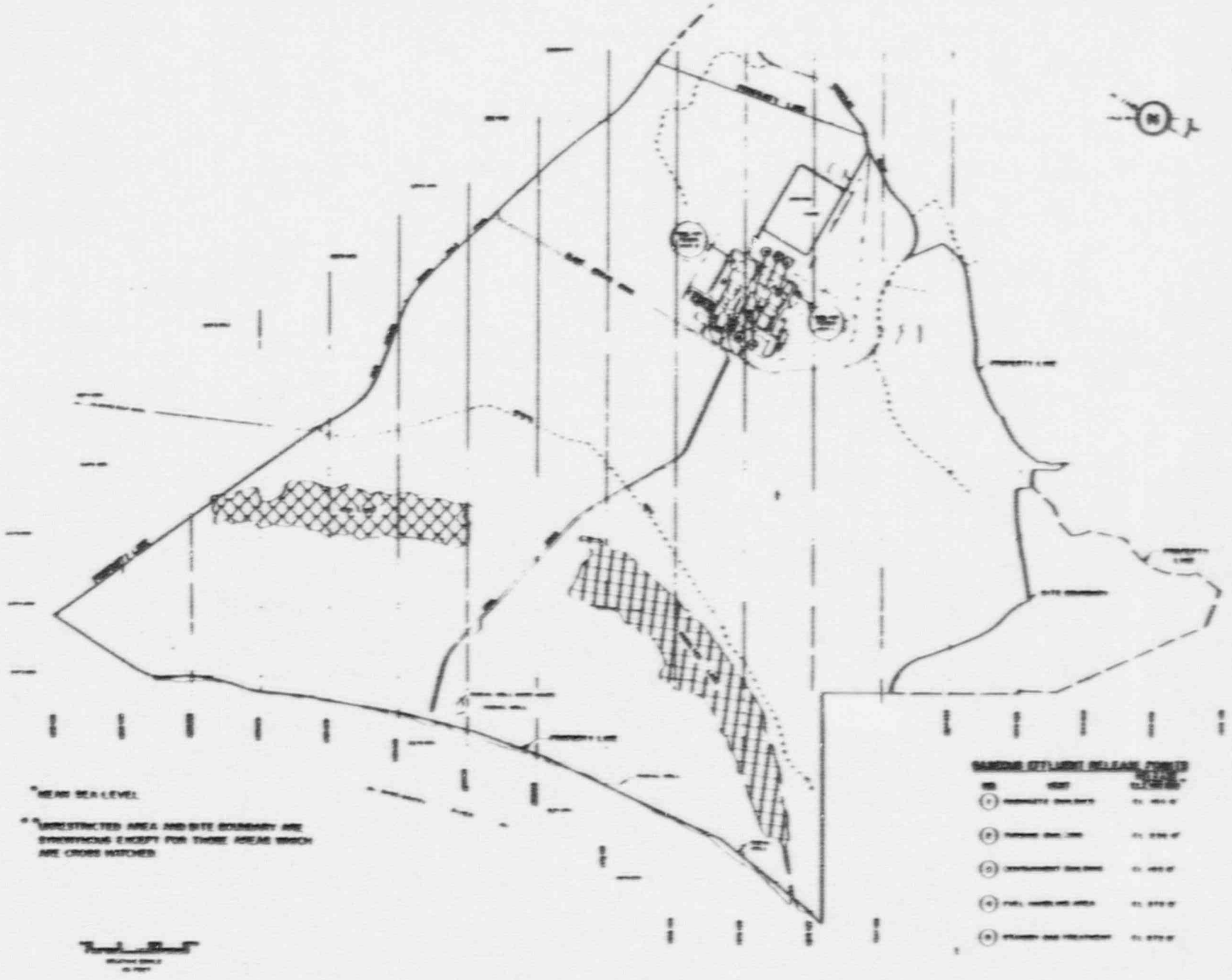

FIGURE 5.1.3-1 UNRESTRICTED AREA** & SITE BOUNDARY